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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/470,976	12/23/1999	MOTOH ASAKURA	3007/48504	6843

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08/13/2003

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/470,976

Examiner

Andrew Schechter

Applicant(s)

ASAKURA ET AL.

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-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5 and 6 is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 15 May 2003 have been fully considered but they are not persuasive.

The applicants argue that "the Examiner admits that the combination of Asakura and Kubota 'would result in an inoperative device'" [p. 3, response] so the asserted combination is improper. This misstates the Examiner's position, which is that "simply inserting the LCD of Kubota into the device of Asakura would result in an inoperative device" (p. 5, previous Office Action, emphasis added). One of ordinary skill in the art would not combine them in this simplistic, inoperative way, but would have the minimal skill to combine them to make a functioning device, as described by the Examiner [p. 5, previous Office Action]. This argument is not persuasive.

The applicant argues that there is no motivation to combine the references; this is not persuasive. The benefit of improved image contrast is taught by *Kubota* as discussed in the rejection [p. 4, previous Office Action]. Furthermore, the applicants admit [p. 5] that "widely used liquid crystal displays... are set so that the axis (plane) of polarization is generally oblique relative to a vertical axis and a horizontal axis of the image plane...along a diagonal line of the image plane in order to keep a bilateral symmetry of angle of visibility." Therefore, an LCD such as that described by *Kubota* would be "widely used" and conventional.

The only remaining argument of the applicants is that it is impermissible hindsight to use an optical rotator to change the polarization angle by 45°. This is not persuasive. As noted by the examiner, this is not a subtle point. *Asakura* requires light polarized at 0° to the vertical to be directed onto the windshield, while the light coming from *Kubota's* LCD is 45° to the vertical. Optical rotators are beyond "well-known" in the liquid crystal art, since in a conventional twisted nematic liquid crystal display (TN-LCD) the liquid crystal layer acts as an optical rotator. One of ordinary skill in the art would therefore find it obvious to use an optical rotator to match the light from *Kubota's* LCD with the light needed by the device of *Asakura*.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Asakura et al.*, U.S. Patent No. 5,999,314 in view of *Kubota et al.*, U.S. Patent No. 5,398,127.

Asakura, in Fig. 2, discloses a very similar device to that of the present Fig. 1 (representing the present claims 1 and 2). *Asakura* shows a display system comprising a transparent plate [1A], a liquid crystal display [6], a light-transmittable reflection film [9], and a first optical rotation layer to rotate polarization by 90° [2]. However, the devices are different in two respects:

A) *Asakura*'s LCD with light-polarizing plate on the output [6 and 7A] produces light at 0° to the vertical axis of the image plane, instead of producing light at 45° to the vertical, and

B) *Asakura* does not disclose a second optical rotation layer, since the light produced by the LCD is already at the desired angle to the vertical.

Kubota discloses [in Fig. 2, as conventional prior art] a twisted nematic LCD having rubbing directions at 45° to the vertical axis of the image plane (this requires the output light of the LCD to be at 45°, due to the nature of the TN device), and motivates this angle for the conventional TN device by saying the "reason that the rubbing directions RD1, RD2 are set at 45 degrees to the gate and source lines 12, 13 is to uniformly adjust the contrast of the image displayed on the entire picture element 14."

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[col. 2, lines 64-68] Based on this, using a conventional TN-LCD producing light at 45° in the device of *Asakura* would have been obvious to one of ordinary skill in the art.

However, simply inserting the LCD of *Kubota* into the device of *Asakura* would result in an inoperative device, since *Asakura* requires light polarized at 0° to the vertical to be directed onto the windshield. This is not a subtle point, so it would have been obvious to one of ordinary skill in the art that the polarization angle must be changed by 45° . There are two ways of doing so which are well-known in the art. First, an absorbing polarizer whose axis is aligned at 0° to the vertical would do so, at the cost of discarding half the intensity of the light. Second, an optical rotation layer (acting the same as a layer of twisted nematic liquid crystal in a conventional TN-LCD) would do so, without discarding half the intensity of the light. Motivated by this better efficiency, it would have been obvious to one of ordinary skill in the art to use an optical rotator in the device of *Asakura* in view of *Kubota* to obtain the needed light polarized at 0° to the vertical.

For these reasons, claims 1 and 2 are not patentable. Similarly comparing *Asakura*'s Fig. 1 with the present claims 3 and 4 (and the present Fig. 2), claims 3 and 4 are also unpatentable for analogous reasons.

Allowable Subject Matter

4. Claims 5 and 6 are allowed.

The prior art does not teach having the display light with an angle of 45° relative to the vertical axis of the image plane, having the light reflect at Brewster's angle to the

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observer, and then having the un-reflected beam rotated by an angle of 45° to become P polarized light which can then pass out of the transparent plate without reflection.

Claims 5 and 6 are therefore allowed.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-4711 for regular communications and (703) 746-4711 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AS
Andrew Schechter
August 8, 2003


TOAN TON
PRIMARY EXAMINER